

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
20 January 2005 (20.01.2005)

PCT

(10) International Publication Number
WO 2005/006700 A1

(51) International Patent Classification⁷: H04L 27/26, 1/06

(21) International Application Number:

PCT/US2004/021028

(22) International Filing Date: 30 June 2004 (30.06.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/483,719 30 June 2003 (30.06.2003) US

60/528,169 9 December 2003 (09.12.2003) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

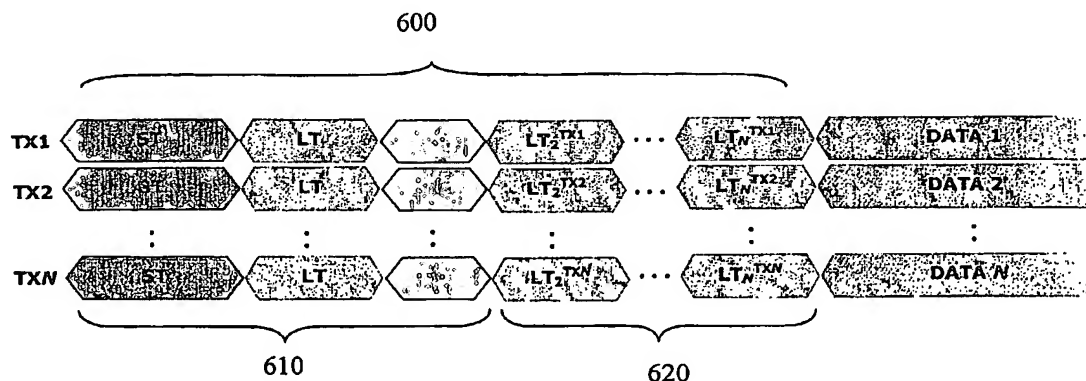
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHODS AND APPARATUS FOR BACKWARDS COMPATIBLE COMMUNICATION IN A MULTIPLE ANTENNA COMMUNICATION SYSTEM USING TIME ORTHOGONAL SYMBOLS



(57) Abstract: A method and apparatus are disclosed for transmitting symbols in a multiple antenna communication system according to a frame structure, such that the symbols can be interpreted by a lower order receiver (i.e., a receiver having a fewer number of antennas than the transmitter). The disclosed frame structure comprises a legacy preamble having at least one long training symbol and N-1 additional long training symbols that are transmitted on each of N transmit antennas. The legacy preamble may be, for example, an 802.11 a/g preamble that includes at least one short training symbol, at least one long training symbol and at least one SIGNAL field. A sequence of each of the long training symbols on each of the N transmit antennas are time orthogonal. The long training symbols can be time orthogonal by introducing a phase shift to each of long training symbols relative to one another.